


Education Update

Education & Public Outreach Committee of the NASA Advisory Committee

March 5, 2012

Leland D. Melvin
Associate Administrator for Education

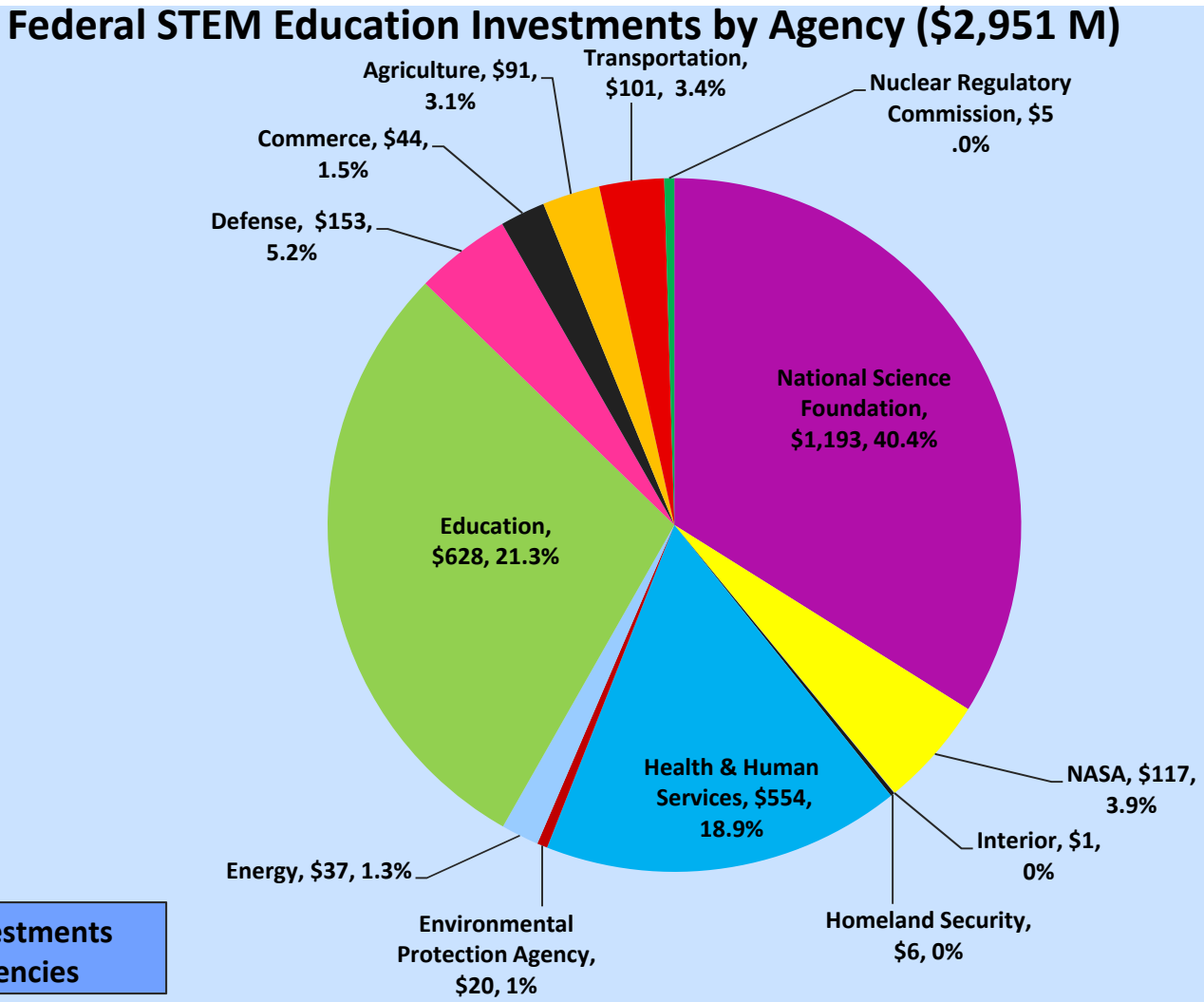



Description of 5-year Federal STEM Education Strategic Plan

The Strategic Plan will provide common goals, outcomes, and strategies to create a coordinated portfolio of STEM education across the Federal government. The Strategic Plan will require Federal agencies to design and revise their STEM education investments to accomplish the following objectives:

1. **Do What We Know Works** – Ensure Federal STEM investments utilize what is known about effective STEM education and best practices in STEM education.
2. **Learn More About and Share What Works** – Improve assessment and evaluation of STEM education investments to facilitate continual improvement and tracking of outputs and outcomes.
3. **Increase Efficiency and Cohesion** – Ensure Federal STEM education investments are coordinated to efficiently utilize and leverage Federal resources.
4. **Identify and Focus on Priority Issues** – Effective K-12 STEM Teacher Education, Engagement in STEM, Undergraduate STEM Education, and Serving Groups Traditionally Underrepresented in STEM.

FY13 Federal Investment in STEM Education

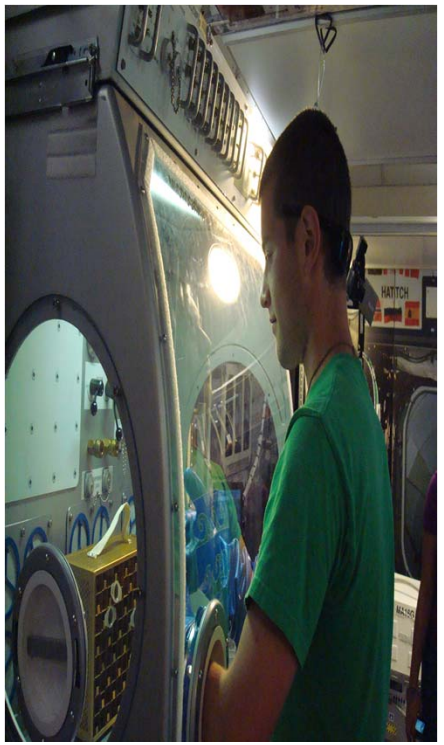


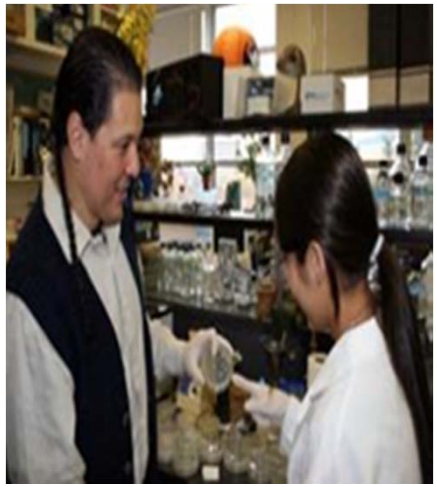
209 investments
13 agencies

*Source: Executive Office of the President, Office of Science and Technology Policy, *Preparing a 21st Century Workforce : Science, Technology, Engineering, and Mathematics Education in the 2013 Budget (Feb 2012)*

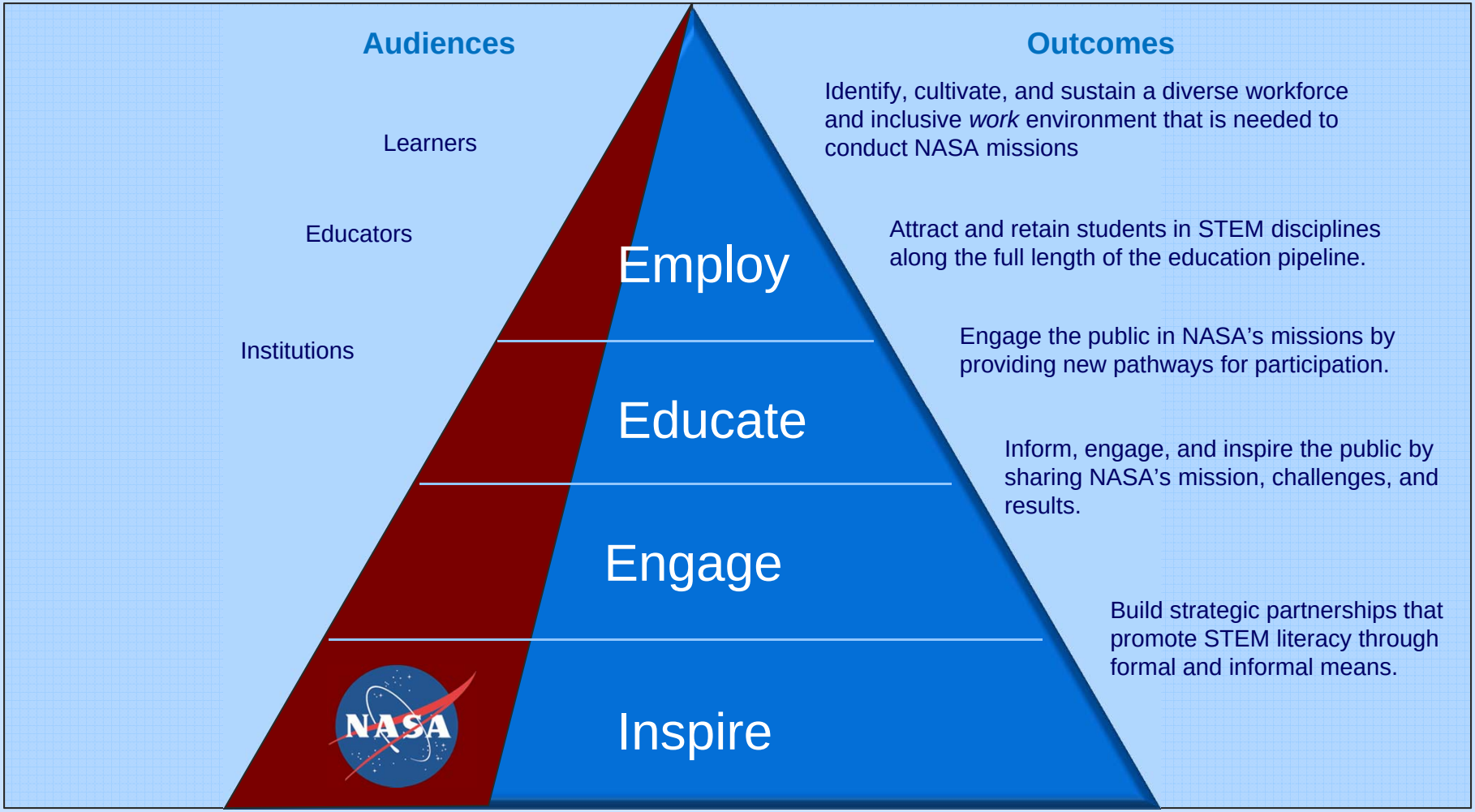
NASA Education Vision Statement

*To advance **high quality** Science, Technology, Engineering, and Mathematics **(STEM) education** using **NASA's unique** capabilities*





STEM Education Framework

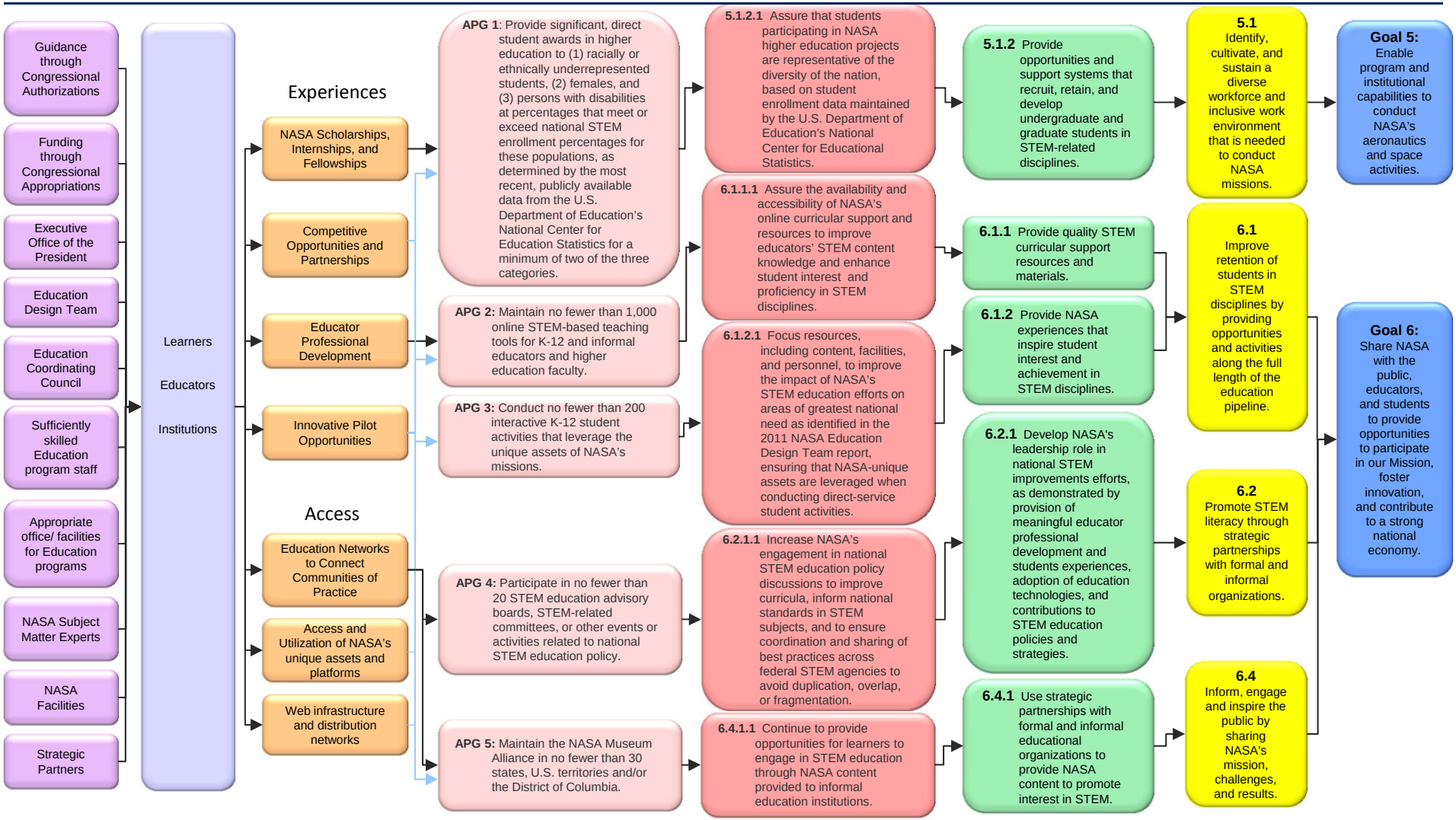


Operating Principles

Relevance • NASA Content • Diversity • Evaluation • Continuity • Partnership/Sustainability

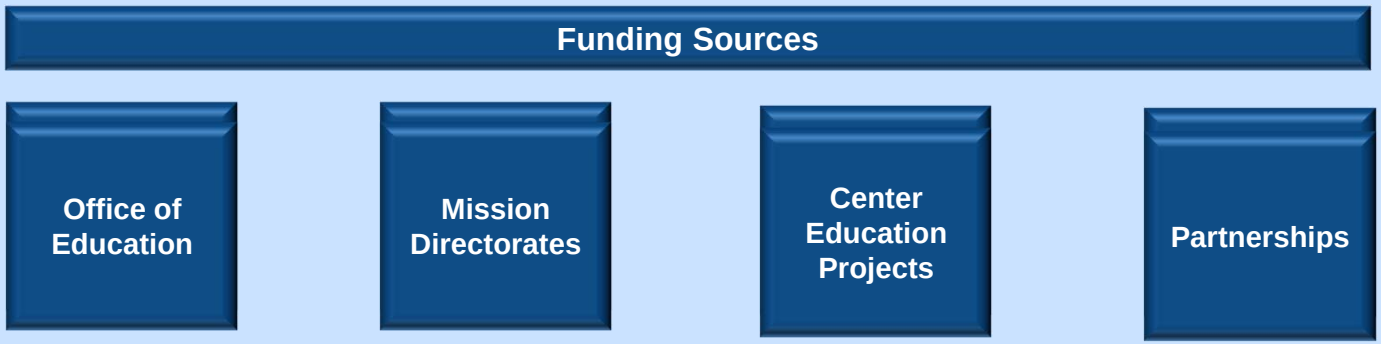
NASA Education - Model

Vision: To advance high quality Science, Technology, Engineering and Mathematics (STEM) education using NASA's unique capabilities.



Investment Strategies

- **All projects will focus on seven consistent investment strategies:**
  - ❑ Educator Professional Development
  - ❑ NASA Scholarships, Internships and Fellowships
  - ❑ Competitive Opportunities and Partnerships
  - ❑ Innovative Pilot Opportunities
  - ❑ Education networks to connect communities of practice
  - ❑ Access to and utilization of NASA's unique assets including ISS National Lab, imagery, data sets, facilities and subject matter experts
  - ❑ Web infrastructure and dissemination of networks



Education Structure: Program, Project & Project Reporting Attributes

Aerospace Research & Career Development

- Space Grant College and Fellowship Program
- Experimental Program to Stimulate Competitive Research (EPSCoR)

STEM Education and Accountability

- Minority University Research & Education Project (MUREP)
- STEM Education and Accountability Project
  - Formal & Informal Education
  - Innovation in Education
  - Evaluation, Performance Monitoring and Accountability

National Space Grant College and Fellowship Program

Recent Accomplishments

• Over 23,000 Space Grant-supported undergraduate and graduate students participated in scholarships, fellowships, internships and authentic hands-on research and engineering challenges. This represents 64% of the reported participants for the Office of Education.

• 26 percent participation of underrepresented students in Space Grant activities.

FY 13 Approach

- Provide competitive grant opportunities for consortia in each state, Puerto Rico and D.C.
- Provide hands-on experiences for students to prepare them for future workforce and/or academic careers
- Conduct state-based programs and projects, including pre-college, higher, and informal education.

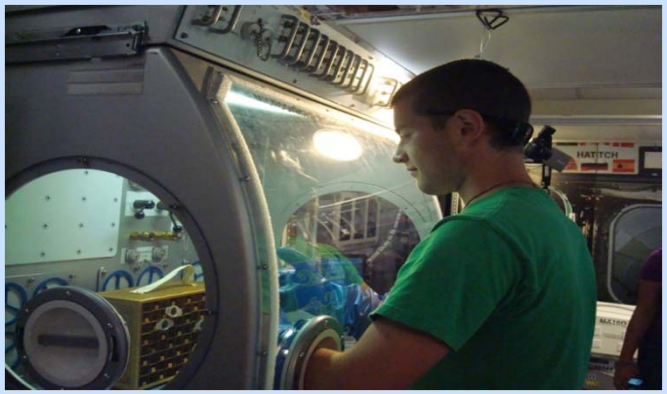
Experimental Program to Stimulate Competitive Research

Recent Accomplishments

•Received 51 proposals in FY 2011 in response to its annual competitive call for research.

•Funded 27 proposals from 20 states with a net value over $20 million.

•Selected proposals represent research or technology development in each NASA Mission Directorate and the Office of the Chief Technologist.



FY 13 Approach

•In FY 2013, NASA EPSCoR will issue a competitive call for extramural research awards, and will also support the second year (of three) of the project's infrastructure development awards to build NASA connections.

•The research solicitation will focus on priority research and technology development needs of NASA Mission Directorates and the Office of the Chief Technologist.

Minority University Research and Education Project

Recent Accomplishments

•Collaborated with Navajo Technical College to provide student stipends and internships to15 Native American students, with six students also participating in eight-week summer internships.

•Sponsored the initial Minority Institutions/Community College Reduced Gravity Education Flight Program in which 14 teams or 70 students and faculty participated representing 7 MI's and 7 community colleges.

•Four University Research Center (URC) project participants located in Texas (i.e., Texas Southern Univ., Prairie View A&M Univ., Univ. of Texas at Brownsville, and UTEP) supported more than 170 undergraduate and graduate students.

•More than 340 students, faculty, and other scientific investigators engaged with the URC project published the results of their research and presented more than 235 papers at conferences.

FY 13 Approach

•MUREP will increase investments supporting undergraduate underrepresented and underserved STEM students, and increasingly target community colleges.

Formal and Informal Education Project

Recent Accomplishments

• Reached more than 1,000,000 students through STEM programs and initiatives, including the Summer of Innovation project.

• More than 67,000 elementary and secondary educators participated in NASA education programs.

• Almost 100,000 educators along the full length of the education pipeline.

• NASA Explorer Schools (NES) activity engaged 170,000 students and 1,300 participating educators across all 50 states.

FY 13 Approach

• Focus resources in alignment with Co-STEM education priorities (Effective K-12 STEM Teacher Education, Engagement in STEM, Undergraduate STEM Education, Serving Groups Traditionally Underrepresented in STEM)

• Provide opportunities for learners to engage in STEM education through NASA content provided to informal education institutions, including NASA visitor centers.

Innovation in Education Project

Recent FY 11 Accomplishments

•SoI served over 41,000 middle school students in grades 4-9 (a 76 percent increase from 2010) and provided professional development experiences to more than 3,700 teachers (certified and informal educators).

•Year-one implementation of the One Stop Shopping Initiative (OSSI) for NASA Internship, Fellowship and Scholarships Opportunities yield an application pool of over 7,000 highly qualified graduate and undergraduate STEM students. Students selected for available opportunities represented all states,, including PR and the VI.

FY 13 Approach

•In FY 2013, NASA will provide competitive opportunities for prospective partners to engage students in authentic, hands-on learning through design challenges and engineering competitions.

• Agency will evaluate SOI three-year pilot for its effectiveness in engaging middle school educators and underrepresented/underserved youth with NASA's content, and improving STEM ability.

•NASA will identify and validate practices that can improve STEM education impacts, and then replicate those that have proven most effective.

Evaluation Performance Monitoring and Accountability Project

Recent Accomplishments

• In FY 2011, NASA provided numerous examples of published, third-party evaluations in response to GAO query on evaluation.

• NASA cited independent assessments of several NASA educational activities, including informal education, and the Science, Engineering, Mathematics and Aerospace Academy, or SEMAA.

FY 13 Approach

•EPMA will build upon the newly designed Office of Education Infrastructure Division (OEID) that provides a unified systematic and standardized approach to data collection and performance evaluation across NASA Education. Robust efforts addressing on-going enhancements of the project's information technology (IT) system will be continued in compliance with Federal and Agency requirements. The OEID IT System will focus on (1) unification and validation of data collection, (2) quarterly evidence-based evaluation, and (3) systemic research and reporting.

Coordination and Partnerships

The LEGO Company

Mary J. Blige & FFAWN

Will.i.am & FIRST Robotics

Education Partnerships: 100Kin10

NASA has partnered with the100Kin10 initiative, which endeavors to increase the number of, develop, and retain excellent mathematics and science teachers.

More than 100 partners including Google, Teach for America and the New York City Department of Education have been gathered by Carnegie Corporation of New York for this initiative.

NASA will leverage its facilities, missions, data, images, and staff to support training and development of educators by providing access to research opportunities, science and engineering activities, and innovations and technologies applicable to the classroom.

Education Partnerships: Digital Badges

Badges for Lifelong Learning Competition

Partner with Project Whitecard and Wheeling Jesuit University's Center for Educational Technologies on a **Robotics and Science, Technology, Engineering and Math (STEM) System.**

Links designers, entrepreneurs, technologists and educators with leading business and industry organizations to build digital badge systems and explore the ways badges can be used to help people learn, demonstrate skills and knowledge, and unlock job, educational and civic opportunities.

Competition is held in collaboration with Mozilla and supported by the John D. and Catherine T. MacArthur Foundation. The Badges for Lifelong Learning Competition winners were announced Thursday, March 1, 2012 at the Digital Media and Learning Conference.

Education Partnerships: Math Science Partnership

The Administration proposes to align the Department of Education's $150 million reauthorized Math and Science Partnership program (to be renamed Effective Teaching and Learning: STEM) and the NSF's $57 million Math and Science Partnership program to ensure that STEM instruction reflects what works.

These partnerships develop and implement pioneering ways of advancing mathematics and science education for students. They bring innovation, inspiration, support, and resources to educators and students in local schools, colleges, and universities.

Education Partnerships: UTeach Engineering

UTeachEngineering

Preparing Secondary Educators to Teach Design-Based Engineering Courses

Collaborative initiative of The University of Texas at Austin and the Austin Independent School District dedicated to developing leaders in the emerging field of secondary engineering education.

Prepares university students and in-service teachers to teach innovative and exciting curricula that will allow their students to discover what engineering is, what engineers do, and the role that engineering plays in shaping their world.

Offers an innovative, design- based high school engineering course aligned with Texas state standards that can be implemented at low cost in virtually any high school setting.

Office of Education Budget

		Notional			
	2013	2014	2015	2016	2017
Education	$100	$100	$100	$100	$100

➢NASA will align the Education Portfolio(Office of Education, Mission Directorate and Center activities) with the priorities and strategies in the NSTC Co-STEM 5-Year Strategic Plan

➢The budget will also focus on competitive opportunities for learners and educators on middle school pre- and in-service educator professional development; provide experiential opportunities, internships, and scholarships for high school and undergraduate students; and use NASA's unique missions, discoveries, and assets to inspire student achievement and educator teaching ability in STEM fields

➢The Office of Education proposes to competitively allocate 63 percent of funds in support of three successful existing programs: EPSCoR, MUREP, and Space Grant.

➢The budget also encourages collaboration between government, academia, and industry to leverage NASA’s investments in STEM to reach a greater number of students and educators.

➢NASA will increase its role in national and state STEM policy discussions and place more emphasis on project evaluation, and external, independent evaluation and assessment, to ensure that investments are providing desirable STEM impacts.

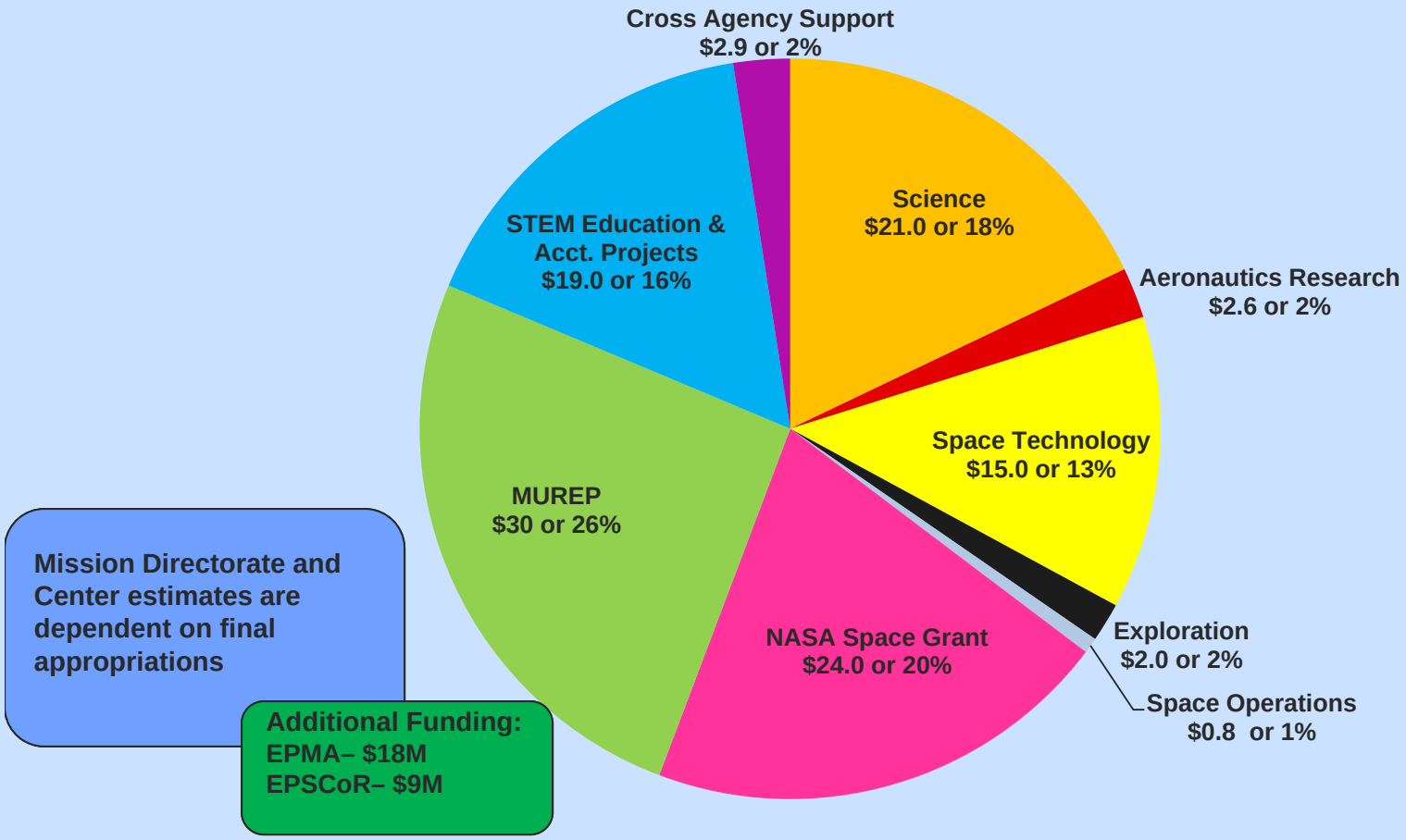
FY 2013 Budget Request

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
OFFICE OF EDUCATION
FY 2013- 2017 AGENCY BUDGET SUBMIT
($ in Millions)

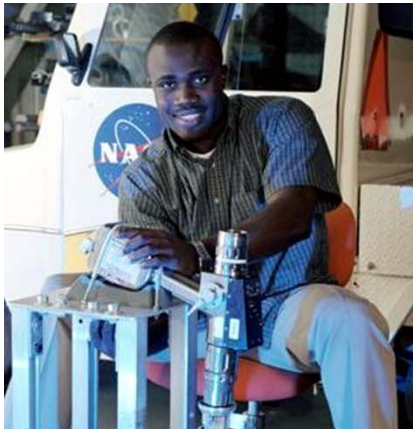
	FY 2012		Notional			
	Estimate	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Education	136.10	100.00	100.00	100.00	100.00	100.00
Aerospace Research & Career Development	56.10	33.00	33.00	33.00	33.00	33.00
NASA Space Grant	38.85	24.00	24.00	24.00	24.00	24.00
EPSCoR	17.25	9.00	9.00	9.00	9.00	9.00
STEM Education & Accountability	80.00	67.00	67.00	67.00	67.00	67.00
Minority University Research & Edcuation Program	30.00	30.00	30.00	30.00	30.00	30.00
STEM Education and Accountability Projects	50.00	37.00	37.00	37.00	37.00	37.00

FY 2013 STEM Education Estimate Investments

FY13 NASA Education Funding by Source



Agency Total Investment $117.3M




Questions or Comments

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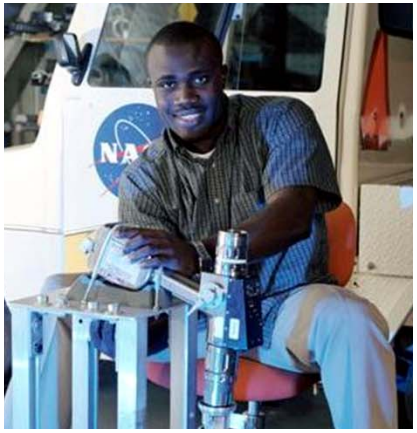


BACK UP

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Education Coordinating Council (ECC)

- **Serves as the Agency's senior decision-making body for strategic direction and planning related to education.**
- **Determines NASA strategic education direction and assesses Agency progress toward achieving NASA's educational Vision.**
- **ECC Membership includes offices and personnel invested in education and is by appointment only. Consistent with Education Design Team Recommendations, ECC members must be empowered by their home organizations to make decisions to direct NASA's policies and investments in education.**
- **Serves as the Agency's senior decision-making body regarding the integrated Agency education portfolio, and to baseline and assess the performance of NASA education projects, programs, Mission Directorate education portfolios, and Center education portfolios to ensure successful outcomes supporting the achievement of NASA strategic education goals and the efficient use of Agency resources.**
- **Authority given under 42 U.S.C. 2473(c) (1), Section 203(c) (1) and Section 203(a) (3) of The National Aeronautics and Space Act of 1958, as amended.**

Agency FY 2010 STEM Education Total Investments